



11-02-09

Sustainable Fuel Cycle Task Force Science Panel

Statement on Nuclear Waste Management and Scientific Integrity

As the federal government moves into 2011 in a continuing resolution, actions taken by the Administration have brought to a standstill all work related to solving the United States' program of high-level radioactive waste and spent nuclear fuel disposal.

No viable alternative solution has been brought forward, let alone authorized by Congress, as a replacement for their directive of July 23, 2002, in Public Law 107-200, approving the site at Yucca Mountain, Nevada, for the development of a repository for the disposal of high-level radioactive waste and spent nuclear fuel, pursuant to the Nuclear Waste Policy Act of 1982.

There is no scientific reason for this situation; in fact the scientific soundness of the selection of Yucca Mountain was well on its way to being independently confirmed by the Nuclear Regulatory Commission (NRC) when the Administration stopped the program. Credible scientific support for the project is found throughout the community of knowledgeable scientists and engineers.

On December 17, 2010, John P. Holdren, Assistant to the President for Science and Technology and Director of the Office of Science and Technology Policy, issued an important memorandum on scientific integrity. The memorandum responded to a March 9, 2009 memorandum issued by President Obama articulating principles central to the preservation and promotion of scientific integrity. As Director of the Office of Science and Technology Policy, Dr. Holdren is responsible for ensuring the highest level of integrity in all aspects of the Executive Branches involved with scientific and technical processes.

There is a conspicuous inconsistency between the intent of the Holdren memorandum and the Administration's actions in suspending activities related to the licensing of Yucca Mountain. To satisfy commitments made during the presidential campaign, the Secretary of Energy, without technical basis, and without consulting Congress, attempted to withdraw, with prejudice, the license application that Congress directed the Department of Energy to prepare and submit to the NRC. The DOE also unilaterally ceased work on the Yucca Mountain project. More than seven months have passed since the NRC's Atomic Safety and Licensing Board (Board) unanimously rejected the Department of Energy's Yucca Mountain project license application withdrawal request. During this time, the Commissioners' impasse in acting to affirm or overturn the Board decision has been accompanied by staff inaction in delivering the Safety Evaluation Report on post closure safety of Yucca Mountain. The failure of the NRC staff to publicly release their Safety Evaluation Report has been challenged by the Board; the staff response only indicates once again that the technical process is being held hostage to political desires, implemented by no less than the Chairman of the NRC himself.



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A likely possible outcome of that Safety Evaluation Report, viewed in light that the NRC staff has stated that all requested information has been provided, is that the staff would agree that the safety of Yucca Mountain has been demonstrated to their satisfaction.

The Holdren memorandum notes that it is important that policymakers involve science and technology experts where appropriate and that the scientific and technological information processes relied upon in policymaking be of the highest integrity. There can be no doubt that by requiring the Department of Energy, in the Nuclear Waste Policy Act, to obtain a license from the NRC, Congress intended just that.

Failing to offer a technical rationale for ceasing work on the Yucca Mountain program, the Secretary of Energy has stated that there is a better way to deal with the wastes than disposal at Yucca Mountain. In passing the Nuclear Waste Policy Act of 1982, Congress found that a national problem had been created by the accumulation of spent nuclear fuel and radioactive waste from reprocessing. Importantly, the language in the Act acknowledged that Federal efforts over 30 years to devise a permanent solution had not been adequate. Those 30 years were marked by false starts on disposal programs and continued rejection of storage alternatives. Every action that has been taken regarding the Yucca Mountain program since the Nuclear Waste Policy Act was passed in 1982 has been specifically requested by Congress. Further, at appropriate points since that time, Congress has been asked to make decisions about the Yucca Mountain repository. Each of these decisions resulted in further action being taken toward development of the repository.

Today, while the legislatively mandated license application sits in limbo, no technical authority has concluded either that Yucca Mountain is not suitable for a repository, or that the science supporting the license application is not sound. There are no published analyses, done in conformance with the applicable requirements and standards that show that the Yucca Mountain site would not meet the safety standards. Statements purporting that the Yucca Mountain site does not meet the safety standards are found to be either not supported by analyses that conform to the regulations, or are based on selected portions of outdated analyses that are not consistent with the current requirements. Moreover, presentations to the Blue Ribbon Commission, empanelled by the Secretary to articulate the “better way to deal with the wastes,” have revealed nothing new. This is not surprising, as the country debated the merits of alternative means of disposal of the wastes for decades before embarking on the path forward legislated by the Nuclear Waste Policy Act. Even the reprocessing options being studied today do not lead to a complete solution. Evaluations have shown that legacy wastes likely will not be reprocessed and will require repository disposal. All known advanced technology options have some residual high level radioactive waste. High-level radioactive wastes have no disposal path other than a repository.



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In their December 2010 report, *Evaluation of the Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel*, the U.S. Nuclear Waste Technical Review Board found that numerous important aspects of long term storage of spent nuclear fuel at the surface are not well understood. Little data are publicly available on the behavior of high-burn up fuel during dry storage and on its subsequent handling and transportation. No information is available on the behavior during dry storage of the more advanced materials now being used for fuel cladding and fabrication of fuel-assembly structural components. The fuel, the dry-storage system components (canister, cask, etc.), and the concrete foundation pad, may all degrade during dry storage. Some degradation mechanisms may be active during the early years of dry storage, while different mechanisms may be active at the lower temperatures that would be expected during extended storage. Accurately predicting how the used fuel and canister temperatures will change over extended dry storage is important; however, little information was found on detailed thermal modeling during the period of extended dry storage. The physical state of the cladding when fuel is placed into dry storage is not currently well characterized. Cladding-degradation mechanisms, their interactions with each other, and the expected behavior of cladding after aging in extended dry storage are not well understood. Also not well understood are some of the conditions that affect these degradation mechanisms, such as predictions of the fuel temperatures over time and the amount of residual water present after drying. Corrosion mechanisms will cause degradation of the metal components of dry-storage systems during extended dry-storage periods.

The Holdren memorandum also requires agencies to develop a culture of scientific integrity, and strengthen the actual and perceived credibility of government research. What better way is there to demonstrate these principles than to let the process move forward as Congress intended to happen? The Nuclear Regulatory Commission staff should be directed to issue the Safety Evaluation Report on post closure safety of Yucca Mountain. This would ensure that, as the Holdren memorandum directs, “data and research used to support policy decisions undergo independent peer review by qualified experts where feasible and appropriate and consistent with law.” It would also facilitate the free flow of scientific and technological information, another tenet of the Holdren memorandum.

A way must be found to restart the Yucca Mountain licensing process. A congressionally directed solution is in place, and science, not just politics, should determine whether or not a license to construct a repository at Yucca Mountain is appropriate. State governors and other state and local elected officials perceive that without a repository, wastes now in 39 states could remain there indefinitely. Furthermore, without a repository interim storage alone is likely to falter as it has each time it has been proposed in the past. There is nothing to indicate that state opposition to repository development would not be expected if the country sought another repository site.



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There are, however, indications that local communities may be willing participants. In particular, Nye County, Nevada, has gone on record indicating its acceptance of the role assigned to it when Congress selected Yucca Mountain for repository development. In fact, five of the nine Nevada Counties identified as affected units of government, have opposed the DOE withdrawal of the Yucca Mountain License Application in submittals to the NRC Atomic Safety Licensing Board

The Science Panel of the Sustainable Fuel Cycle Task Force was created to provide independent science based perspectives on issues related to a sustainable nuclear fuel cycle, and offers its services as a source of scientific information about all waste management technical and licensing issues, including Yucca Mountain. If we can be of assistance, please do not hesitate to contact us.

Sincerely,
Science Panel

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